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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,864	04/18/2001	Tao T. Tao	T0457/7003 TJO	7511
23628	7590	01/25/2005	EXAMINER	
WOLF GREENFIELD & SACKS, PC FEDERAL RESERVE PLAZA 600 ATLANTIC AVENUE BOSTON, MA 02210-2211			MARTIN, ANGELA J	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/837,864

Applicant(s)

TAO ET AL.

Examiner

Angela J. Martin

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-48, 52 is/are rejected.  
7) ☒ Claim(s) 49-51 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/25/04.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

This Office Action is responsive to the Amendment filed on October 25, 2004. The Applicant has canceled claims 53-113, with prejudice, and has amended claim 42. However, the rejection is made non-final for the following reasons of record.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 8, 9, 23-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Koch, DE 4004220 (abstract; referred to in PCT).

Rejection of claims 1, 4, 8, 9, 23-31 drawn to an electrochemical device.

Koch teaches an electrochemical device comprising an anode, which is chemically rechargeable, and a source of fuel exposable to the anode (abstract). It teaches the anode comprises metal (abstract). It also teaches the anode is chemically rechargeable to a reduced state from an oxidized state comprising an oxide consisting of a metal oxide (abstract). It teaches the device is capable of producing electricity in the absence of fuel (abstract). It also teaches the device is operable at temperatures below 1000 degrees C (abstract). In addition, it teaches the anode comprises lead (abstract). It teaches the fuel, when exposed to the anode, is in contact with the anode (abstract).

Thus, the claims are anticipated.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 3, 5-7, 10-22, 32-42, 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch, DE 4004220, in view of Natsuko et al., GB2278010.

Rejection of claims 2, 3, 5-7, 10-22, 32-42, 46-48 drawn to an electrochemical device.

Natsuko et al., teach an electrochemical device comprising a source of a chemical reductant to chemically recharge the anode (abstract). It teaches the reductant is the source of the fuel (p. 2, last 2 paragraphs). It also teaches the anode comprises at least two metals (p. 5, Example 1). It teaches the electrolyte in ionic communication with the anode (p. 3, last para.). It teaches the electrolyte is a solid-state electrolyte (p. 3, last para.). It also teaches the electrolyte has a formula of  $ZrO_2$  (p. 5, Example 1). It teaches a cathode in ionic communication with the electrolyte (p. 5, Ex. 1). It also teaches the cathode is a solid-state cathode (p. 5, Ex. 1). In addition, it teaches the cathode is a metal oxide (p. 5, Ex. 1). It teaches the cathode is comprises a metal; platinum (p. 3, para. 7). It teaches the fuel is in contact with the anode (p. 3, last para. to

p. 4, para. 1). It teaches the source of fuel is a reservoir of fuel (Fig. 1). It also teaches the fuel is a carbonaceous material; which is a hydrocarbon; the hydrocarbon is a natural gas (p. 5, para. 4).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to insert the teachings of Natsuko et al., into the teachings of Koch because the electrochemical device would be more efficient by chemically recharging the anode, as described in Natsuko et al. Additionally, anode metals of the references are those taught in the Application and would therefore have a standard reduction potential greater than 0.070 V versus the Standard Hydrogen Electrode. The cathode material described is well known in the art and the electrical output described would be within the described range since the anode, cathode, and electrolyte materials are equivalent within the prior art references.

#### ***Allowable Subject Matter***

5. Claims 49-51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

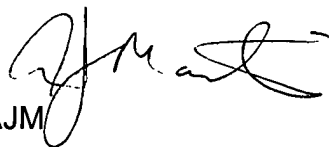
6. The following is a statement of reasons for the indication of allowable subject matter: The Applicant claims an electrochemical device as described in claim 1, wherein the device is self-repairing; the anode comprises a sealant precursor to seal a flaw in a solid state electrolyte when exposed to oxygen.

The prior art of record does not disclose the above described anode having a sealant precursor for self-repairing of the device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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